

**Claims**

1. A method for temporary marking an object (O) in a process chain, the method comprising the step of applying a coating composition (3) to the object (O) by a marking device, the said coating composition (3) comprising a short-lived radioactive isotope, wherein said short-lived radioactive isotope is generated in situ from a longer-lived radioactive precursor isotope and added to said coating composition (3) in said marking device.
2. Method according to claim 1, characterized in that said short-lived radioactive isotope has a half-life time comprised between a minute and a day.
3. Method according to claim 1 or 2, characterized in that said short-lived radioactive isotope is a gamma-radiation emitter or a  $\beta(+)$ -emitter.
4. Method according to one of claims 1 to 3, characterized in that the short-lived radioactive isotope is selected from the group comprising  $^{99m}\text{-Tc}$ ,  $^{60m}\text{-Co}$ ,  $^{90m}\text{-Y}$ ,  $^{103m}\text{-Rh}$ ,  $^{106m}\text{-Rh}$ ,  $^{137m}\text{-Ba}$ ,  $^{144m}\text{-Pr}$ ,  $^{144}\text{-Pr}$ ,  $^{212}\text{-Pb}$ , and  $^{211}\text{-Pb}$ .
5. Method according to one of the preceding claims, characterized in that the coating composition (3) is applied to said object (O) by ink-jet printing or by a spraying operation.
6. Method according to claim 5, characterized in that said ink-jet printing or spraying is of the drop-on-demand type.

7. Method according to one of the preceding claims, characterized in that said coating composition (3) contains at least one binder.
8. Method according to one of the preceding claims, characterized in that the application of the coating composition (3) is performed upon receipt of a particular signal, preferably an electric signal, by said marking device.
9. Device suitable for temporary marking an object (0) in a process chain, said device comprising a short-lived radionuclide generator (1), a first reservoir (2) of a printing liquid, a splitting valve (5), a radiation monitor (6), a control unit (7) and a printing or marking head (8).
10. Device according to claim 9, wherein said radionuclide generator (1) generates a gamma-emitting or  $\beta(+)$ -emitting radioactive isotope, said radioactive isotope having a half-life time comprised between a minute and a day.
11. Device according to claim 10, wherein said radionuclide generator (1) generates a gamma-emitting short-lived radioactive isotope, which is preferably selected from the group comprising  $99m$ -Tc,  $60m$ -Co,  $90m$ -Y,  $103m$ -Rh,  $106m$ -Rh,  $137m$ -Ba,  $144m$ -Pr,  $144$ -Pr,  $212$ -Pb, and  $211$ -Pb.
12. Device according to one of the claims 9 to 11, wherein said printing or marking head (8) is an ink-jet printing head, preferably a drop-on-demand ink-jet printing head.
13. Device according to one of the claims 9 to 12, wherein said device comprises further a second reservoir (11), containing

printing liquid, and a dosing pump (13), the printing liquid being free of radioactive isotopes.

14. A system for temporary marking an object (O) in a process chain, said system comprising

- a) at least one device for temporary marking an object (O), preferably a device according to one of the claims 9 to 13; and
- b) at least one detecting device for detecting the presence of the temporary marking on an object (O), wherein the device for applying the temporary marking comprises a short-lived radionuclide generator (1), a first reservoir (2) of a printing liquid, a splitting valve (5), a radiation monitor (6), a control unit (7) and a printing or marking head (8), wherein the device is activated upon receipt of a signal, preferably an electric signal, and wherein the detecting device is capable of detecting gamma-radiation, and producing a signal, preferably an electric signal, upon detection of said temporary marking.

15. A method for temporary marking and identifying an object (O), the method comprising the steps of

- applying a coating composition (3) to the object (O), by a marking device, wherein the coating composition (3) comprises a short-lived radioactive isotope; and
- identifying the temporary marking by detecting gamma-radiation emitted by the short-lived radioactive isotope; wherein said short-lived radioactive isotope is generated in situ from a longer-lived radioactive precursor isotope and added to said coating composition (3) in said marking device.

16. Use of a short-lived radioactive isotope in an ink or coating composition for temporarily marking and identifying an object (0) in a process chain, wherein said short-lived radioactive isotope is generated in situ from a longer-lived radioactive precursor isotope and added to said coating composition (3) in said marking device.